CLAIMS

1. A biomedical member formed from a composite ceramic including an alumina phase and a zirconia crystal phase, wherein said biomedical member contains a metallic component such as Mo, W or a mixture of Mo and W or metal oxide phase such as SrO or Y_2O_3, and sintering additives, and a mean grain size of said zirconia crystal phase is 0.5 μm or smaller.

2. The biomedical member according to claim 1, wherein the mean grain size of said zirconia crystal phase is 0.35 μm or smaller, the mean grain size of said metal phase is 1 μm or smaller, the amount of the metal phase is from 5 to 25% by weight of the total, and 95% or more of said metal phase exists in the grain boundaries of said zirconia crystal phase.

3. The biomedical member according to claim 1, wherein there exists an alumina phase having a mean grain size of 0.5 μm or smaller in the grain boundaries of the zirconia crystal phase and the metal phase.

4. The biomedical member according to claim 1 or 2, wherein said alumina phase is contained in the amount not higher than 30% by weight.

5. The biomedical member according to claim 1, including 65 to 96% by weight of said alumina phase, 4 to 34.4% by weight of said zirconia crystal phase and sintering additives

containing 0.20% by weight or more SiO_2, 0.22% by weight or more TiO_2 and 0.12% by weight or more MgO, while the total amount of SiO_2, TiO_2 and MgO is in a range from 0.6 to 4.5% by weight.

6. The biomedical member according to claim 5, wherein a mean grain size of said Al_2O_3 is 3 μm or smaller.

7. The biomedical member according to claim 5, wherein 70% or more of said ZrO_2 is tetragonal crystal.

8. The biomedical member according to claim 5, wherein an atomic rate Ti/Mg of TiO_2 and MgO is in a range from 0.5 to 1.2.

9. The biomedical member according to claim 5, wherein at least a part of the TiO_2 and MgO is dissolved in an Al_2O_3 crystal so as to form a solid solution crystal, and the total amount of these materials dissolved is 0.1% by weight or more of said Al_2O_3.

10. The biomedical member according to claim 5, wherein oxides of at least one of Ti and Mg or composite oxide grains containing said oxides are dispersed in at least a part of said Al_2O_3 crystal grains.

11. The biomedical member according to claim 5, wherein specific wear of said sintered ceramics is 0.3×10^{-10} mm^2/N or less after being subjected to accelerated aging test conducted in saturated water vapor of 121°C for 152 hours.

12. The biomedical member according to claim 1, including

65% by weight or more of alumina phase, 4 to 34% by weight of zirconia phase and 0.1 to 4% by weight of SrO, while Sr forms a solid solution with part of said ZrO_2 grains.

13. The biomedical member according to claim 12, comprising TiO_2, MgO and SiO_2 as the sintering additives.

14. The biomedical member according to claim 12, wherein said composite ceramics contains 0.20% by weight or more SiO_2, 0.22% by weight or more TiO_2 and 0.12% by weight or more MgO, while the total amount of SiO_2, TiO_2 and MgO is in a range from 0.6 to 4.5% by weight.

15. The biomedical member according to claim 12, wherein the Al_2O_3 grains in said composite ceramics have elongated shape observed in SEM image, mean value of the largest dimensions of said Al_2O_3 grains, namely the size along major axis thereof, is 1.5 μm or smaller, aspect ratio that is the ratio of the major axis size to the minor axis size of the Al_2O_3 grains, namely the size along the direction perpendicular to the major axis, is 2.5 or less and a median value between the mean minor axis size and mean major axis size is 1 μm or less.

16. The biomedical member according to claim 12, wherein specific wear rate of said composite ceramics is 0.3×10^{-10} mm^2/N or less after being subjected to accelerated aging test conducted in saturated water vapor of 121°C for 152 hours.

17. The biomedical member according to claim 1, which

constitutes a sliding member of an artificial joint, wherein said artificial joint is an artificial hip joint or an artificial knee joint, and the sliding member of said artificial joint is a femoral head or an acetabulum socket sliding member of the artificial hip joint.

18. A method for producing a biomedical member that is formed from a composite ceramic including an alumina phase and a zirconia crystal phase and contains metallic component such as Mo, W or a mixture of Mo and W, or a metal oxide phase such as SrO or Y_2O_3, and sintering additives, comprising a process for mixing raw materials that contain Al, Zr, Si, Ti, Mg in the form of metals or compounds of metals so that the mixture of the raw materials contains 0.20% by weight or more SiO_2, 0.22% by weight or more TiO_2 and 0.12% by weight or more MgO while the total amount of SiO_2, TiO_2 and MgO is in a range from 0.6 to 4.5% by weight, when contents of the metals or the compounds of the metals are converted to the contents of metal oxides, a process for forming the mixed ceramic powder into a compact in a predetermined shape and a process for sintering the compact at a temperature in a range from 1300 to 1500°C thereby to obtain a sintered ceramics.

19. The method for producing the biomedical member according to claim 17, which comprises the process for sintering of the compact at a temperature in a range from

1300 to 1500°C in the oxidizing atmosphere, and a process for heat treating the sintered ceramics at a temperature at least 60°C lower than the sintering temperature in a reducing atmosphere.

20. The method for producing the biomedical member according to claim 17, wherein hot isostatic treatment is applied at a temperature at least 30°C lower than said sintering temperature, after sintering.